

FORM PTO-1390
RE 7. 2/01

U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

TRANSMITTAL LETTER TO THE UNITED STATES
DESIGNATED/ELECTED OFFICE (DO/EO/US)
CONCERNING A FILING UNDER 35 U.S.C. 371ATTORNEY'S DOCKET NUMBER
03715.0080U.S. APPLICATION NO.
(If known, see 37 CFR 1.5)

09/786191 ✓

INTERNATIONAL APPLICATION NO.

PCT/FR00/01903

INTERNATIONAL FILING DATE

July 4, 2000 ✓

PRIORITY DATE CLAIMED

July 5, 1999 ✓

TITLE OF INVENTION

APPARATUS AND A METHOD OF MANUFACTURING PACKAGING BAGS

APPLICANT(S) FOR DO/EO/US

Henri Georges BOIS

Applicant(s) herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☐ This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (21) indicated below.
4. ☐ The US has been elected by the expiration of 19 months from the priority date (Article 31).
5. ☒ A copy of the International Application as filed (35 U.S.C. 371 (c)(2)).
 - a. ☐ is attached hereto (required only if not communicated by the International Bureau).
 - b. ☒ has been communicated by the International Bureau.
 - c. ☐ is not required, as the application was filed with the United States Receiving Office (RO/US).
6. ☒ An English language translation of the International Application as filed (35 U.S.C. 371 (c)(2)).
 - a. ☒ is attached hereto.
 - b. ☐ has been previously submitted under 35 U.S.C. 154 (d)(4).
7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371 (c)(3)).
 - a. ☐ are attached hereto (required only if not communicated by the International Bureau).
 - b. ☐ have been communicated by the International Bureau.
 - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
 - d. ☒ have not been made and will not be made.
8. ☐ An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371 (c)(3)).
9. ☐ An oath or declaration of the inventor(s) (35 U.S.C. 371 (c)(4)).
10. ☐ An English language translation of the annexes of the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371 (c)(5)).

Items 11 to 20 below concern document(s) or information included:

11. ☐ Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☐ A **FIRST** preliminary amendment.
14. ☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
15. ☐ A Substitute specification.
16. ☐ A change of power of attorney and/or address letter.
17. ☐ A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821-1.825.
18. ☐ A second copy of the published international application under 35 U.S.C. 154 (d)(4).
19. ☐ A second copy of the English language translation of the international application 35 U.S.C. 154 (d)(4).
20. ☒ Other items or information:
 - a. ☒ Copy of cover page of International Publication No. WO 01/02162
 - b. ☐ Copy of Notification of Missing Requirements.
 - c. ☐

U.S. APPLICATION NO. (If known, see 37 CFR 1.5)

097786191

INTERNATIONAL APPLICATION NO. PCT/FR00/01903

ATTORNEY'S DOCKET NUMBER
03715.008021. ☒ The following fees are submitted:**BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)):**Neither international preliminary examination fee (37 CFR 1.482)
nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO

and International Search Report not prepared by the EPO or JPO\$1000.00

International preliminary examination fee (37 CFR 1.482) not paid to

USPTO but International Search Report prepared by the EPO or JPO\$860.00

International preliminary examination fee (37 CFR 1.482) not paid to

USPTO but International Search fee (37 CFR 1.445(a)(2)) paid to USPTO\$710.00

International preliminary examination fee (37 CFR 1.482) paid to USPTO

but all claims did not satisfy provisions of PCT Article 33(1)-(4)\$690.00

International preliminary examination fee (37 CFR 1.482) paid to USPTO

and all claims satisfied provisions of PCT Article 33 (1)-(4)\$100.00

ENTER APPROPRIATE BASIC FEE AMOUNT =

\$ 860.00

Surcharge of \$130.00 for furnishing the oath or declaration later than
months from the earliest claimed priority date (37 CFR 1.492 (e)).☐ 20 ☐ 30

\$

CLAIMS	NUMBER FILED		NUMBER EXTRA	RATE		
Total Claims	21	- 20 =	1	x \$18.00	\$ 18.00	
Independent Claims	2	- 3 =		x \$80.00	\$	
MULTIPLE DEPENDENT CLAIM(S) (if applicable)				+ \$270.00	\$ 270.00	

TOTAL OF THE ABOVE CALCULATIONS =

\$1148.00

☐ Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above are reduced by 1/2.

\$

SUBTOTAL =

\$1148.00

Processing fee of \$130.00 for furnishing the English translation later than
months from the earliest priority date (37 CFR 1.492(f)).☐ 20 ☐ 30

\$

TOTAL NATIONAL FEE =

\$1148.00

Fee for recording the enclosed assignment (37 CFR 1.21 (h)). The assignment must be accompanied by
an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property.

+

\$

TOTAL FEES ENCLOSED =

\$1148.00

Amount to be refunded: \$

charged: \$

- a. ☒ A check in the amount of \$ 1148.00 to cover the above fees is enclosed.
- b. ☐ Please charge my Deposit Account No. _____ in the amount of \$ _____ to cover the above fees.
A duplicate copy of this sheet is enclosed.
- c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to
Deposit Account No. 06-0916. A duplicate copy of this sheet is enclosed.
- d. ☐ Fees are to be charged to a credit card. **WARNING:** Information on this form may become public. **Credit card information should not be included on this form.** Provide credit card information and authorization on PTO-2038.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137 (a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:Finnegan, Henderson, Farabow, Garrett & Dunner, L.L.P.
1300 I Street, N.W.
Washington, D.C. 20005-3315

SIGNATURE

Ernest F. Chapman, Reg. No. 25,961

NAME/REGISTRATION NO.

DATED: March 2, 2001

2/PRTS

APPARATUS AND A METHOD OF MANUFACTURING PACKAGING BAGS

The present invention relates to the field of manufacturing packaging bags.

More precisely, the present invention relates to apparatuses for manufacturing packaging bags from a continuously travelling film fitted with at least one tape having an opening/closing function. More precisely still, the present invention relates preferably to apparatuses for manufacturing bags in which the tape having an opening/closing function extends transversely to the travel direction of the film.

Nevertheless, as described in greater detail below, the present invention is not limited to this specific application. The invention can also be applied to apparatuses in which said tapes having an opening/closing function are disposed parallel to the travel direction of the film or obliquely relative to said direction.

Numerous apparatuses of this kind are known.

The tape having an opening/closing function can take numerous forms.

By way of example, the tape having an opening/closing function can be formed by complementary closure strips, e.g. male/female strips, or strips with complementary hooks, placed on opposite faces of the film.

The tape having an opening/closing function can also be formed by a tear/cut tape or strip, an adhesive tape, which can optionally be a peel-off tape, or indeed a metal tape for closing by being folded, etc.

Such apparatuses for manufacturing packaging bags are known in which travel takes place horizontally or vertically.

In particular, so-called form, fill, and seal (FFS) machines are known which automatically form the bags, fill them, and then close them.

In particular, FFS machines are known that comprise:
· means for delivering the film in the plane state;

· means for shaping the film into a tubular state on a forming neck;

· means for closing the resulting tube longitudinally, generally by heat-sealing;

5 · a funnel which opens out into the tube formed in this way for conveying the product that is to be packaged; and

· means for fixing the tubular film in a transverse direction, generally again by heat-sealing.

10 Still more precisely, said means are generally designed to provide almost simultaneously a line of heat-sealing that constitutes, for example, the bottom of a bag that is upstream in the travel direction, a second line of heat-sealing closing the mouth of a bag
15 downstream therefrom, and a line of cut sectioning the tubular film so as to separate the finished downstream bag from the upstream bag that is in preparation.

 In particular, machines now exist that have a station designed for fixing the tape having an
20 opening/closing function onto the film upstream from the forming neck, and to do so transversely relative to the travel direction of the film.

 Nevertheless, in a variant, the closure tape can be placed longitudinally, i.e. parallel to the travel
25 direction of the film, or indeed obliquely relative to said direction.

 Those known machines have already given good service.

 Nevertheless, they do not always give complete
30 satisfaction in the sense that it is sometimes difficult to control accurately proper positioning of the tape having an opening/closing function.

 This problem is particularly severe with machines that operate continuously with the film travelling at
35 very high speed.

 An object of the present invention is thus to improve conventional apparatuses for manufacturing

packaging bags by enabling the positioning of the tape having an opening/closing function to be detected reliably.

5 In the context of the present invention, this object is achieved by apparatus for forming bags and including at least one sensor suitable for detecting the presence of the tape having an opening/closing function when it is in a predetermined position relative to means for treating the film cyclically in order to form bags, and
10 in particular relative to means provided on the apparatus for closing the bag-constituting film transversely.

According to an advantageous additional characteristic of the present invention, the sensor is constituted by a mechanical feeler.

15 The present invention also provides a method of making bags.

Other characteristics, objects, and advantages of the present invention will appear on reading the following detailed description and from the accompanying
20 drawings which are given as non-limiting examples, and in which:

- Figure 1 is a diagrammatic view of apparatus for forming packaging bags in accordance with the present invention;

25

- Figures 2 and 3 are views on a larger scale of a sensor in accordance with the present invention, respectively when detecting proper positioning of a tape and when detecting wrong positioning thereof;

30

- Figure 4 is a fragmentary side view of the apparatus showing the location of the sensor; and

- Figures 5, 6, 7, and 8 are views similar to Figures 2 and 3 for a dual sensor and respectively on the assumption that positioning of the tape in question is detected as being correct, in Figure 5, and incorrect in
35 Figures 6, 7, and 8.

The description below relates essentially to apparatus in which the closing/opening tape is placed

transversely to the travel direction of the film.
 Nevertheless, the invention is not limited to this
 disposition. The invention also applies to apparatuses
 in which the closing/opening tape is placed parallel to
 5 the travel direction of the film, or obliquely relative
 thereto.

Figure 1 shows apparatus for forming packaging bags
 to which the invention applies particularly, but not
 exclusively. Specifically this is an FFS type machine
 10 with the film travelling vertically.

Figure 1 shows a roll 10 from which a plane film 12
 is unrolled.

The film 12 is guided by various wheels or
 equivalent means which are not described in detail below
 15 insofar as they can be embodied in a wide variety of
 ways.

In the context of the invention and preferably, the
 apparatus has a station 14 downstream from the roll 10
 for the purpose of placing an opening/closing tape on the
 20 film 12 transversely to the travel direction of the film.

The film 12 then reaches a forming neck 16. This is
 shaped in such a manner that on leaving the forming neck
 16, the film 16 is in a tubular state. A filling funnel
 18 is disposed above the forming neck 16 and opens out
 25 into the tube that it forms. In conventional manner, the
 filling funnel 18 is used to insert the product which is
 to be packaged into the bag blanks that are formed by
 said tubular film.

Means shown diagrammatically in Figure 1 under
 30 reference 20 are designed to close the tubular film
 longitudinally, e.g. by heat-sealing.

Downstream from this station 20, there is an
 assembly 30 which is designed to perform the following
 operations:

35 • using means 32 to make a transverse line of heat-
 sealing on an upstream bag blank, to correspond to the
 bottom of the upstream bag;

· using means 34 to make a transverse line of heat-sealing to finish off a downstream bag, the line of heat-sealing being provided at the mouth thereof;

· using sectioning means 36 interposed between the
5 above-specified means 32 and 34 to section the film so as to separate the completed downstream bag from the upstream bag blank; and

· optionally using means 38 for finishing off the fixing of the tape having an opening/closing function on
10 the wall of the film.

Where appropriate, the tape having an opening/closing function can be fixed in the station 14 to only half of the width of the film, with the tape being fixed to the other half of the width of the film
15 downstream from the forming neck 16 by the above-mentioned means 38.

The machine shown in Figure 1 is a vertical travel machine.

The present invention applies equally well to
20 horizontal travel machines.

Furthermore, the present invention can also be applied to apparatuses for forming bags by using a film 12 that is prefitted on the reel 10 with transversely-extending tape having an opening/closing function.

25 Similarly, the invention applies to apparatuses for forming bags in which the tape having the opening/closing function is fitted to the film 12 at a location other than that shown in Figure 1, for example at the forming neck 16 or downstream therefrom.

30 As mentioned above, the present invention applies to any type of tape having an opening/closing function for bags, in particular it applies to tapes comprising complementary closure strips such as male/female strips, strips having complementary hooks, tear/cut tapes,
35 adhesive tapes, which can optionally be peel-off tapes, metal strips for closing by being folded, etc. . . .

The tape having the opening/closing function is given overall reference 60.

Similarly, the present invention applies to any type of film 12, for example plastics films, single layer or
5 composite plastics films, metallized films, etc. . . .

As mentioned above, in the context of the present invention, at least one sensor is provided that is suitable for detecting the presence of the tape in an expected predetermined position relative to means for
10 treating the film cyclically.

The sensor 100 is preferably constituted by a mechanical feeler comprising a pusher 102 that is urged towards the film 12, which film is sandwiched between the feeler or pusher 102 and an anvil-forming abutment 110.
15 The pusher 102 is associated with an electrical contactor 104 that is responsive to the position of the pusher 102, i.e. is opened or closed depending on whether the opening/closing tape 60 is or is not present, and does or does not form an extra layer of thickness between the
20 abutment 110 and the pusher 102.

Preferably, in the context of the present invention, the sensor 100 is placed downstream from the jaws 100 that perform transverse heat-sealing on the film.

Still more precisely, the sensor 100 and the anvil 110 are preferably carried by the equipment that supports
25 the jaws 30 so that the anvil 110 and the sensor 100 are cyclically moved away from and moved towards to the film 12 synchronously with the heat-sealing jaws 30 so as to avoid disturbing the travel of the film 12.

Still more precisely, as shown diagrammatically in Figure 4, the sensor 100 is preferably located level with the longitudinal edge of the bag that is remote from the edge via which the tape having an opening/closing
30 function 60 is fed.

35 In Figure 4, an arrow referenced A represents the feeding of the tape 60.

The person skilled in the art will understand that the sensor 100 of the present invention makes it possible to detect simultaneously:

- the presence of the tape 60 having an opening/closing function;
- proper feeding in the transverse direction of the tape 60, i.e. it can verify that the film is covered by the tape 60 (otherwise if the tape 60 does not cover the entire mouth of the bag, a subsequent closure defect can be expected, or even a subsequent leak); and
- that the tape 60 is properly positioned in the longitudinal direction relative to the travel direction of the film (wrong positioning in this direction would lead to the tape having an opening/closing function being wrongly positioned relative to the mouth of the bag).

Thus, in Figure 2, there can be seen the case of the tape 60 when it is properly positioned relative to the heat-sealing jaws 30. In contrast, Figure 3 shows a case when the tape 60 is detected as being in an incorrect position (in this case, the tape 60 is too far forward relative to the travel direction of the film).

When a problem is detected in this way and indicated by the sensor 100, it is possible to take action to reposition the film correctly. The present invention thus makes it possible to eliminate drift due in particular to the intrinsic elasticity of the film 12, or indeed to deformation thereof because of its quality, or indeed depending on the type of product being packaged or the way in which the product is poured into the bags via the funnel 18.

Where appropriate, as shown in Figures 5 to 8, it is possible in the context of the present invention to use a dual feeler 100a, 100b where the two feelers are juxtaposed in the film travel direction. As will be understood in particular on examining Figures 6 and 7, such a dual feeler makes it possible to improve the

detection of positioning since it makes it possible to detect a simple offset from the expected position.

According to an advantageous additional characteristic of the invention, two sensors 100 can be provided respectively at the two opposite longitudinal edges of the film 12 so as to detect a fault in the positioning of the strip 60, whereby the strip slopes relative to a direction that extends accurately at right angles across the travel direction of the film.

Furthermore, as mentioned above, the present invention applies equally well to apparatuses in which the opening/closing strip is placed not transversely but longitudinally, i.e. parallel to the travel direction of the film, or indeed obliquely relative to said direction (in which case the positions of the sensors need to be adapted accordingly). In the oblique case, it is possible to provide at least two sensors respectively close to each of the edges of the bag on a generator line that slopes relative to the travel direction of the film and that corresponds to the expected oblique position of the tape.

Naturally, the present invention is not limited to the particular embodiments described above, but extends to any variant within the spirit of the invention.

CLAIMS

- 1/ Apparatus for forming bags by means of a continuously travelling film fitted with at least one tape (60) with an opening/closing function that is placed on the film (12), the apparatus being characterized by the fact that it includes at least one sensor (100) suitable for detecting the presence of the tape (60) having an opening/closing function when it is in a predetermined position relative to means (30) for treating the film cyclically in order to form bags, and in particular relative to the means (30) provided on the apparatus for closing the bag-constituting film transversely.
- 2/ Apparatus according to claim 1, characterized by the fact that the sensor is formed by a mechanical feeler.
- 3/ Apparatus according to claim 1 or 2, characterized by the fact that the sensor (100) is placed after a set of transverse heat-sealed jaws (30) relative to the travel direction of the film (12).
- 4/ Apparatus according to any one of claims 1 to 3, characterized by the fact that the sensor (100) is secured to equipment carrying the transverse heat-sealing jaws (30) so that the sensor (100) is moved cyclically towards and away from the film (12).
- 5/ Apparatus according to any one of claims 1 to 4, characterized by the fact that the sensor (100) is formed by a mechanical feeler having a pusher (102) associated with an electrical contactor (104).
- 6/ Apparatus according to any one of claims 1 to 5, characterized by the fact that it includes means (16) for shaping the film into a tubular state, means (18) suitable for filling the tubular bag blank formed in this

way, and means (30) suitable for closing the bag on the packaged product.

5 7/ Apparatus according to any one of claims 1 to 6, characterized by the fact that it includes means (14) suitable for fixing the tape (60) onto the film (12).

10 8/ Apparatus according to any one of claims 1 to 6, characterized by the fact that it uses a film (12) that is already fitted with the tape (60) having the opening/closing function.

15 9/ Apparatus according to any one of claims 1 to 8, characterized by the fact that it includes means for causing the film (12) to travel vertically.

20 10/ Apparatus according to any one of claims 1 to 8, characterized by the fact that it includes means for causing the film (12) to travel horizontally.

25 11/ Apparatus according to any one of claims 1 to 10, characterized by the fact that the tape (60) having an opening/closing function is selected from the group comprising: complementary closure strips, e.g. male/female strips or strips having complementary hooks; tear/cut tapes; adhesive tapes, which can optionally be peel-off tapes; and metal tapes for closing by folding.

30 12/ Apparatus according to any one of claims 1 to 11, characterized by the fact that the sensor (100) is located along a longitudinal edge of the bag remote from the edge via which the tape (60) is delivered.

35 13/ Apparatus according to any one of claims 1 to 12, characterized by the fact that the sensor (100) is adapted to detect the presence of a tape (60), to detect that the tape (60) has been fed properly in the direction

that is transverse to the travel direction of the film (12), and to detect that the tape is properly positioned in the longitudinal direction of the film (12).

5 14/ Apparatus according to any one of claims 1 to 13, characterized by the fact that each sensor comprises dual feelers (100a, 100b) that are juxtaposed in the longitudinal travel direction of the film (12).

10 15/ Apparatus according to any one of claims 1 to 14, characterized by the fact that the tape (60) extends transversely to the travel direction of the film (12).

15 16/ Apparatus according to any one of claims 1 to 14, characterized by the fact that the tape (60) is disposed parallel to the travel direction of the film (12).

20 17/ Apparatus according to any one of claims 1 to 14, characterized by the fact that the tape (60) is disposed obliquely relative to the travel direction of the film (12).

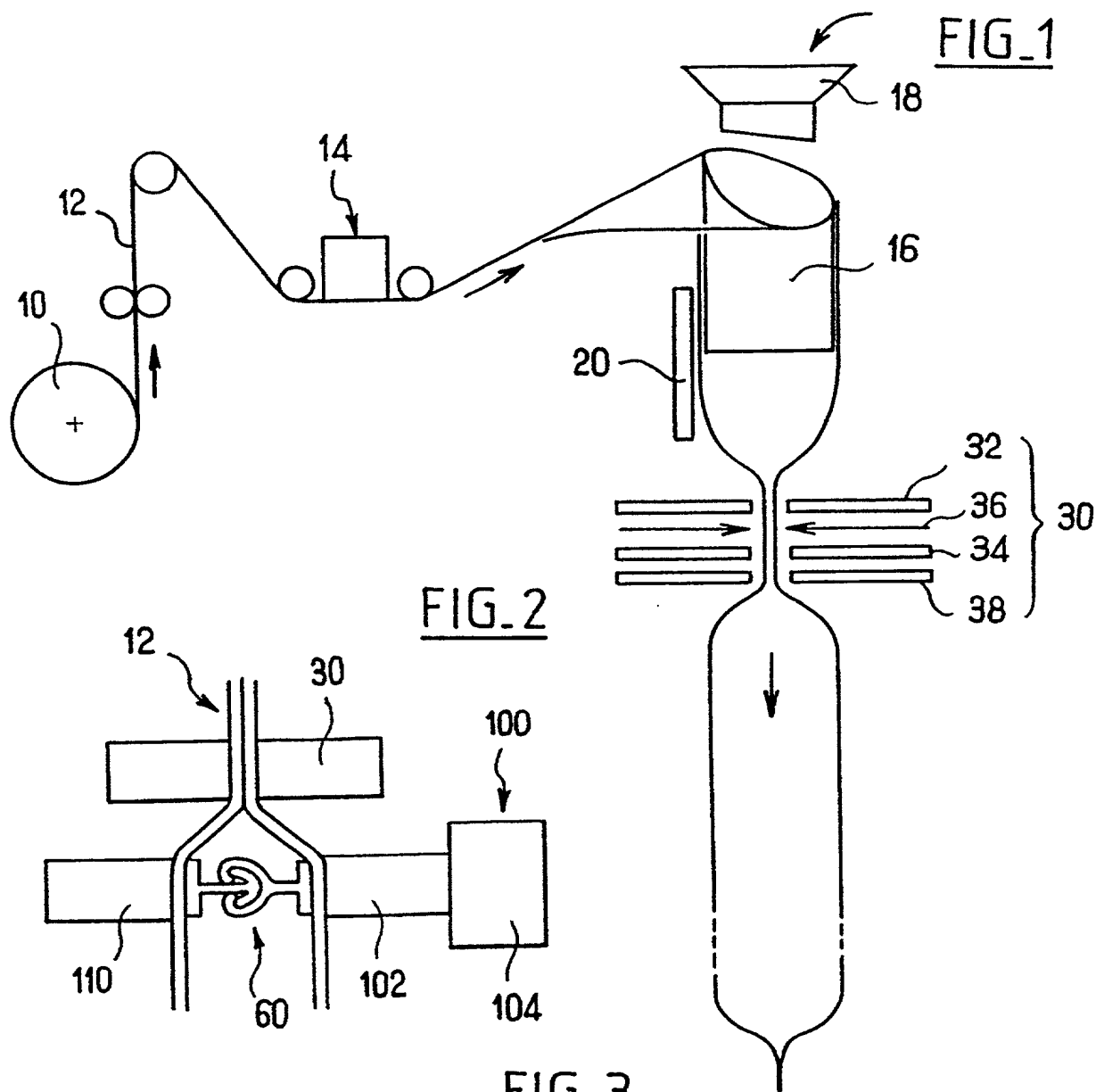
25 18/ Apparatus according to claim 17, characterized by the fact that it has two sensors (100) disposed close to respective edges of the bag along a generator line that is oblique relative to the travel direction of the film and that corresponds to the expected oblique position for the tape.

30 19/ A method of forming packaging bags using a continuously travelling film fitted with at least one tape (60) having an opening/closing function placed on the film, the method being characterized by the fact that it comprises a step consisting in detecting the presence
35 of the tape (60) having the opening/closing function by means of at least one sensor (100) in a predetermined position relative to the means (30) for cyclically

processing the film in order to form a bag, in particular relative to means (30) provided on the forming apparatus to close the bag-forming film transversely.

- 5 20/ A method according to claim 19, characterized by the fact that the sensor (100) is formed by a mechanical feeler placed on the longitudinal edge of the film remote from the edge via which the tape (60) is delivered.

1 / 2



2 / 2

FIG. 4

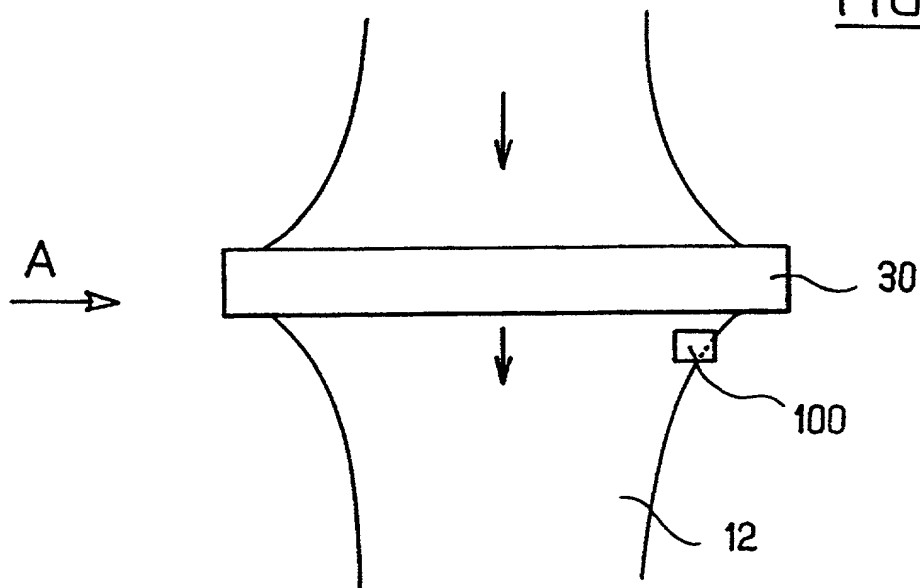


FIG. 5

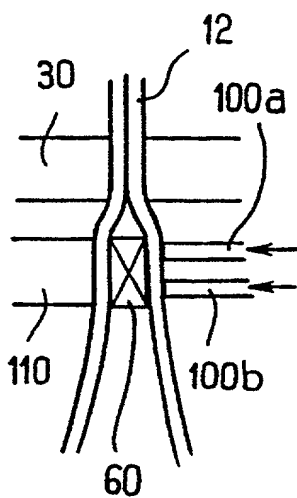


FIG. 6

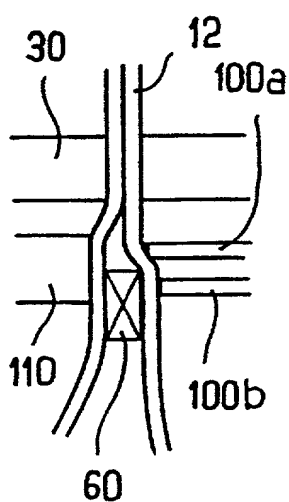


FIG. 7

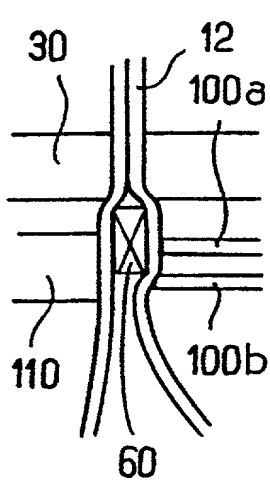
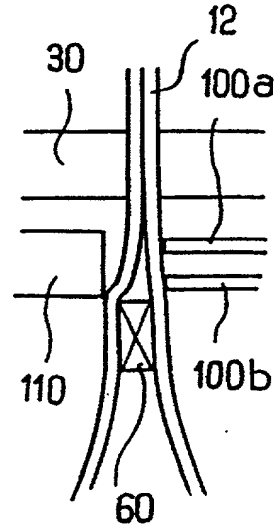


FIG. 8



DECLARATION AND POWER OF ATTORNEY

As a below named inventor, I hereby declare that: my residence, post office address and citizenship are as stated below next to my name; I believe I am the original, first, and sole inventor (if only one name is listed below) or an original, first, and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled: Apparatus and a method of manufacturing packaging bags

the specification of which ☐ is attached and/or ☒ was filed on July 4, 2000 ☒ as United States Application Serial No. _____ or PCT International Application No. PCT/FR00/01903 and was amended on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above. I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR § 1.56.

I hereby claim foreign priority benefits under 35 U.S.C. § 119(a)-(d) or § 365(b) of any foreign application(s) for patent or inventor's certificate or § 365(a) of any PCT international application(s) designating at least one country other than the United States, listed below and have also identified below, any foreign application(s) for patent or inventor's certificate, or any PCT International application(s) having a filing date before that of the application(s) of which priority is claimed:

Country	Application Number	Date of Filing	Priority Claimed Under 35 U.S.C. 119
FRANCE	99/08625	5.07.1999	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
			<input type="checkbox"/> YES <input type="checkbox"/> NO

I hereby claim the benefit under 35 U.S.C. § 119(e) of any United States provisional application(s) listed below:

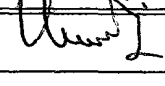
Application Number	Date of Filing

I hereby claim the benefit under 35 U.S.C. § 120 of any United States application(s) or § 365(c) of any PCT International application(s) designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application(s) in the manner provided by the first paragraph of 35 U.S.C. § 112, I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR § 1.56 which became available between the filing date of the prior application(s) and the national or PCT International filing date of this application:

Application Number	Date of Filing	Status (Patented, Pending, Abandoned)

I hereby appoint the following attorney and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith: FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER, L.L.P., Douglas B. Henderson, Reg. No. 20,291; Ford F. Farabow, Jr., Reg. No. 20,630; Arthur S. Garrett, Reg. No. 20,338; Donald R. Dunner, Reg. No. 19,073; Brian G. Brunsvold, Reg. No. 22,593; Tipton D. Jennings, IV, Reg. No. 20,645; Jerry D. Voight, Reg. No. 23,020; Laurence R. Hefter, Reg. No. 20,827; Kenneth E. Payne, Reg. No. 23,098; Herbert H. Mintz, Reg. No. 26,691; C. Larry O'Rourke, Reg. No. 26,014; Albert J. Santorelli, Reg. No. 22,610; Michael C. Elmer, Reg. No. 25,857; Richard H. Smith, Reg. No. 20,609; Stephen L. Peterson, Reg. No. 26,325; John M. Romary, Reg. No. 26,331; Bruce C. Zotter, Reg. No. 27,680; Dennis P. O'Reilly, Reg. No. 27,932; Allen M. Sokal, Reg. No. 26,695; Robert D. Bajefsky, Reg. No. 25,387; Richard L. Stroup, Reg. No. 28,478; David W. Hill, Reg. No. 28,220; Thomas L. Irving, Reg. No. 28,619; Charles E. Lipsey, Reg. No. 28,165; Thomas W. Winland, Reg. No. 27,605; Basil J. Lewis, Reg. No. 28,818; Martin I. Fuchs, Reg. No. 28,508; E. Robert Yoches, Reg. No. 30,120; Barry W. Graham, Reg. No. 29,924; Susan Haberman Griffen, Reg. No. 30,907; Richard B. Racine, Reg. No. 30,415; Thomas H. Jenkins, Reg. No. 30,857; Robert E. Converse, Jr., Reg. No. 27,432; Clair X. Mullen, Jr., Reg. No. 20,348; Christopher P. Foley, Reg. No. 31,354; John C. Paul, Reg. No. 30,413; Roger D. Taylor, Reg. No. 28,992; David M. Kelly, Reg. No. 30,953; Kenneth J. Meyers, Reg. No. 25,146; Carol P. Einaudi, Reg. No. 32,220; Walter Y. Boyd, Jr., Reg. No. 31,738; Steven M. Anzalone, Reg. No. 32,095; Jean B. Fordis, Reg. No. 32,984; Barbara C. McCurdy, Reg. No. 32,120; James K. Hammond, Reg. No. 31,964; Richard V. Burgujian, Reg. No. 31,744; J. Michael Jakes, Reg. No. 32,824; Dirk D. Thomas, Reg. No. 32,600; Thomas W. Banks, Reg. No. 32,719; Christopher P. Isaac, Reg. No. 32,616; Bryan C. Diner, Reg. No. 32,409; M. Paul Barker, Reg. No. 32,013; Andrew Chanhon Sonu, Reg. No. 33,457; David S. Forman, Reg. No. 33,694; Vincent P. Kovalick, Reg. No. 32,867; James W. Edmondson, Reg. No. 33,871; Michael R. McGurk, Reg. No. 32,045; Joann M. Neth, Reg. No. 36,363; Gerson S. Panitch, Reg. No. 33,751; Cheri M. Taylor, Reg. No. 33,216; Charles E. Van Horn, Reg. No. 40,266; and Linda A. Wadler, Reg. No. 33,218; and _____ Please address all correspondence to FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER, L.L.P., 1300 I Street, N.W., Washington, D.C. 20005, Telephone No. (202) 408-4000.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Full Name of First Inventor <u>BOIS, Henri-Georges</u>	Inventor's Signature 	Date <u>21.02.2001</u>
Residence <u>NEUILLY SUR SEINE</u>	<u>FRX</u>	Citizenship <u>FRANCE</u>
Post Office Address <u>61, Boulevard d'Inkermann</u>		

Listing of Inventors Continued on Page 2 hereof. ☐ Yes ☒ No